REFERENCE: 52

IDEM. Standard Operation Procedure, Chemistry Support Residential Well Sampling

June 5, 2007 12 pages

Chemistry Support Residential Well Sampling
P-001-OLQ-S-CH-07-S-R0

Standard Operating Procedure

Office: Office of Land Quality
Branch: Science Services
Section: Chemistry Section

Revised: N/A **Revision Cycle:** Every 2 years
Effective date: Upon Approval

Scope of operations
This Standard Operating Procedure (SOP) outlines the collection of residential well water samples as it relates to the Quality Assurance Project Plan (QAPP). This SOP is limited to the actual sample collection only and does not cover Access Agreements, Sample Request Sheet Sign-Off, Contract Laboratory Set-Up, Field Documentation, Sample Shipping, and Data Verification and Validation, which are under separate individual SOPs.

Scope of applicability
This SOP applies to all OLQ staff that will be collecting residential well samples during field sampling events.

Reference: 52

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Authorized Signatures

I approve and authorize this Standard Operating Procedure:

Section QA Contact

Fran Metcalfe — Typed/Printed | Signed | 5/10/07 — Date

Section Chief(s)

Steve Buckel — Typed/Printed | Signed | 5-10-07 — Date

Barry Steward — Typed/Printed | Signed | 5/10/07 — Date

Branch QA, Coordinator

David Harrison — Typed/Printed | Signed | 5/10/07 — Date

Branch Chief(s)

Laura Steadham — Typed/Printed | Signed | 10 MAY 2007 — Date

Branch Chief, Remediation Services

BRUCE A. OERTEL — Typed/Printed | Signed | 5.14.07 — Date

Branch QA Coordinator, Remediation Services

Nancy DOLLAR — Typed/Printed | Signed | 5-15-07 — Date

Branch Chief, Permits

THOMAS LINSON — Typed/Printed | Signed | 5/22/07 — Date

Branch QA Coordinator, Permits

Michael E. Sickels — Typed/Printed | Signed | 5-16-07 — Date

Branch Chief, Compliance and Response

BRUCE KIZER	Bruce Kizer	5/25/2007
Typed/Printed	Signed	Date

Branch QA Coordinator, Compliance and Response

Tom Daugherty	Tom Daugherty	5/25/07
Typed/Printed	Signed	Date

OLQ Assistant Commissioner

BRUCE H PALIN	Bruce H Palin	5/30/07
Typed/Printed	Signed	Date

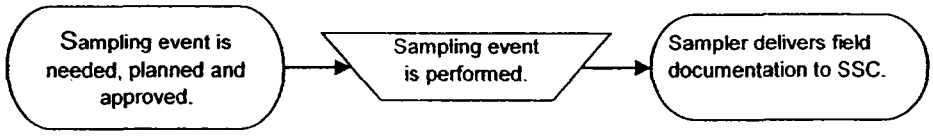
IDEM Quality Manager(s)

This Standard Operating Procedure is consistent with agency requirements.

Lowell Johnson	6/5/07
Indiana Department of Environmental Management Quality Assurance Program Planning and Assessment	Date

Table of Contents

1. Overview work flow chart



2. Definitions

Agency: The Indiana Department of Environmental Management

Assistant Commissioner: An Assistant Commissioner with the Indiana Department of Environmental Management. *(Universal)*

"Authorized" – Established by official authority and usage; as with a policy, standard operating procedure (SOP), or quality assurance project plan (QAPP) that is signed and dated.

Branch Chief: A management level position in one of the Program Area branches in the Agency. *(Universal)*

Chain-of-Custody: An unbroken trail of accountability that ensures the physical security of samples, data, and records.

Chemistry Gatekeepers: The person in the Chemistry Section of OLQ that is the site Chemist (if there is one), or any Environmental Chemist 1 (EnvChem1) or Compliance and Response Branch Senior Environmental Manager 1 (SEM1).

Environmental Chemist (EC): Staff level position within the chemistry section.

Environmental Chemist Supervisor (ECS): A first-level Agency supervisor responsible for managing non-supervisory Agency staff. *(Universal)*

Environmental Samples: Any media taken from a specific location that will be analyzed by a laboratory for data acquisition purposes.

Laboratory: The facility authorized by the Indiana Department of Administration or the Indiana Department of Health (ISDH) that performs the analysis of environmental samples for the Office of Land Quality.

Office of Land Quality (OLQ): One of the major departments within the Indiana Department of Environmental Management (IDEM).

Personal Protection Equipment: See 29 CFR 1910 and Agency P-001-OLQ-X-XX-06-P-R1, Personal protective equipment, or PPE, is designed to protect employees from serious workplace injuries or illnesses resulting from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards.

Program Area: The OLQ program areas include, but are not limited to, the Leaking Underground Storage Tank (LUST) program, the State Cleanup program, the Brownfields program, the Federal Programs, the Site Assessment program, the Voluntary Remediation program, the Permitting programs, and the Compliance programs.

Project Manager (PM): Person who coordinates, oversees, plans and makes programmatic recommendations with regard to work that includes the collection, use, or reporting of environmental data. For the purposes of IDEM, the work may involve activities such as permitting, monitoring, investigation, or remediation.

Quality Assurance (QA): An integrated system of management activities involving planning, implementation, documentation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the client. *(A-005-OEA-06-P-R0)*

Quality Control (QC): The overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality. In other words, QC involves measuring the "thing produced" against a standard to ensure it is a quality product that meets the identified need. *(A-005-OEA-06-P-R0)*

Quality Assurance Project Plan (QAPP): A document describing in comprehensive detail the necessary quality assurance, quality control, and other technical activities to ensure that the results of the work performed will satisfy the stated performance criteria. Quality Assurance Project Plans commonly apply to data gathering activities associated with projects and lab procedures. QAPPs are commonly needed for remediation projects, and mitigation projects. QAPPs may contain one or more standard operating procedures.

Quality Assurance Officer (QAO): The person in the Science Services Branch of OLQ responsible for ensuring that QA criteria are met. *(A-005-OEA-06-P-R0)*

Request for Proposal (RFP) Process: A procurement method, authorized by IC 5-22-9, that provides a formal process for the procurement of goods or services for which price is not the sole factor in the selection of a respondent or respondents. The RFP process requires a state agency provide documentation that outlines available funds and specifies the requested goods and/or services for the purpose of soliciting formal work proposals from contractors. Work proposals are then evaluated by the Department of Administration for optimal value to the agency before the agency selects the contractor. The RFP process is reserved for contracts with a remunerated value of more than $75,000, whereby price is not the sole factor in the selection of a Respondent(s). Please see the flowchart for more information and/or access IDOA Procurement at http://www2.idoa.state.in.us/proc/baarfp.htm. *(A-013-OEA-06-P-R0)*

Section Chief: A first-level Agency supervisor responsible for managing non-supervisory Agency staff. *(Universal)*

Sampler: Individual responsible for the collection and documentation of the sampling event.

Sampling Equipment: Various devices used to collect samples as described in USEPA documentation.

Sampling Event: The occasion in which environmental samples (soil, sediment, water, etc.) are collected and submitted to a laboratory for analysis.

Sample Field Sheet (SFS): The required document identifying a specific sample location during a field sampling event.

Sample Request Sheet (SRS): The required document requesting a sampling event.

Sample Set-Up Chemist (SSC): The person in the Chemistry Section of OLQ that provides coordination of the sampling event between the project manager and ISDH or contract laboratory.

Science Services Branch (SSB): The division within the Office of Land Quality (OLQ) responsible for scientific related technical support.

Site Information Sheet (SIS): The required document identifying general information (site name, site number, sample numbers, weather conditions, field equipment, types of samples, etc.) that provides an overview of the field sampling event.

3. Roles

Role Title
Chemistry Gatekeeper (An Environmental Chemist (EC))
Sample Set-up Chemist ((SSC) An assigned EC)
Environmental Chemist Supervisor (ECS)
Project Manager (PM)
Section Chief (SC)
Branch Chief (BC)
Assistant Commissioner (AC)

Responsibilities:
Chemistry Gatekeeper (CG): Responsible for ensuring that the sample request sheet is technically adequate to meet the project objective. The Chemistry Gatekeeper is to provide technical assistance and recommendations for the following: sampling goal/purpose, sample type, number of samples, collection methods, locations, analytical parameters and methods, and any other special considerations.
Sample Set-up Chemist (SSC): Responsible for determining the estimated laboratory cost of the requested sampling and analysis event and makes arrangements with the laboratory for analytical services.
Project Manager (PM): Person who determines if a sampling event is necessary. The PM then coordinates the sampling event by filling out and acquiring the appropriate signatures, acquiring access agreements, contacting residents, overseeing, and/or collecting the samples at the site in order to make site decisions.
ECS, SC, BC and AC: As appropriate, the Section and/or Branch Chief(s) and/or Assistant Commissioner evaluate the SRS "Reason for Sampling" and the "Projected Cost" to make the determination for approval.

Experience requirements:
EC2: Two year full-time experience as an analytical chemist in the environmental field.
Substitution: Accredited graduate training in the above areas may substitute for the required experience on a year for year basis. Working knowledge of program requirements and sampling protocols.
EC1: Four year full-time experience as an analytical chemist in the environmental field.
Substitution: Accredited graduate training in the above areas may substitute for the required experience on a year for year basis. Working knowledge of program requirements and sampling protocols.

ECS: Five (5) years full-time professional experience as an analytical chemist. At least two (2) years of the above experience must be in an administrative, leadership, managerial or supervisory capacity. Working knowledge of program requirements and sampling protocols.
PM: Working knowledge of program requirements and sampling protocols.
SC(s), BC(s) and AC(s): Full-time professional experience in an environmental or environmental public health field; or related field; or related experience. Specified minimal years of the required experience must be in an administrative, leadership, managerial, or supervisory capacity.

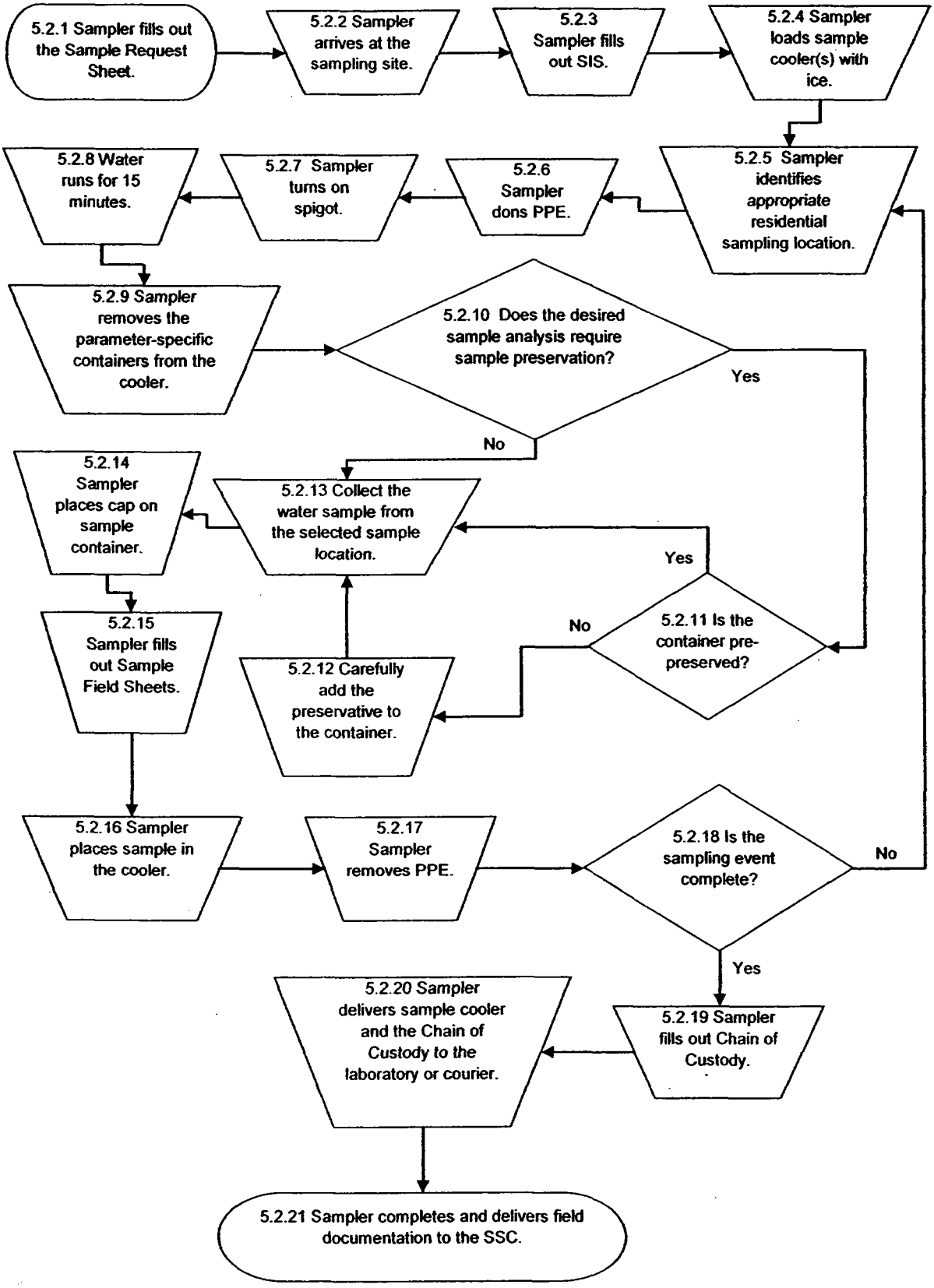
Qualifications and Training requirements:
EC2: Graduation from an accredited college/university plus years of experience. (Major in CHEMISTRY required.)
EC1: Graduation from an accredited college/university plus years of experience. (Major in CHEMISTRY required.)
ECS: Graduation from an accredited college/university plus years of experience. (Major in CHEMISTRY required.)
PM: Full-time professional experience with 5 years in an environmental or environmental public health field or related experience, and attendance at mandatory internal sampling training.
SC(s), BC(s) and AC(s): Full-time professional experience in an environmental or environmental public health field; or related field; or related experience. Specified minimal years of the required experience must be in an administrative, leadership, managerial, or supervisory capacity.

4. Description of equipment, forms, and/or software to be used

Equipment: Sample cooler, sample containers, ziplock-type plastic bags, plastic garbage bags, ice, a permanent ink pen/marker, nitrile gloves, paper towels, clipboard, and adjustable wrench.
Sheets/Forms: A copy of the Sample Request Sheet, Site Information Sheet, Sample Field Sheets, Chain-of-Custody Form, Access Agreement
Software: e-mail, Microsoft Word, and Microsoft Excel.

5. Procedure

5.1 Procedural Flowchart



5.2 Procedure

1. Sampler fills out the sample request sheet as described in the Chemistry Support Sample Request Sign-Off SOP assuring to identify all aspects relative to the appropriate QAPP sampling requirements.
2. Sampler arrives at the sampling site with sufficient ice for the sampling cooler(s).
3. Sampler fills Site Information Sheet (SIS) and Sample Field Sheets as described in the Chemistry Support Field Documentation SOP.
4. Sampler loads sample cooler(s) with ice to refrigerate samples as they are collected. It is recommended to use a 3:1 ratio of ice to sample containers. Ice may be enclosed in ziplock-type bags and evenly distributed among the samples containers as they are collected.
5. Sampler locates the appropriate sample collection location.
6. Sampler dons Personal Protection Equipment (PPE) as described in the Health and Safety Policy, "Health and Safety Requirements In Lieu of a Site Specific Health and Safety Plan When Sampling Residential Water Wells (Agency P-001-OLQ-X-XX-06-P-R1)
7. Sampler turns on tap or spigot.
8. Sampler allows water to run for a minimum of 15 minutes to purge the water holding tank and well.
9. Sampler removes the parameter-specific containers from the cooler and labels the containers with permanent ink/marker.
10. Does the desired sample analysis require sample preservation? If yes, continue to step 11; if no, skip to step 13.
11. Is the bottle pre-preserved? If yes, skip to step 13; if no, continue to step 12.
12. Sampler carefully adds the appropriate provided preservative to each of the parameter specific sample containers (if sampling inside the home, preservative should be added before entering).
13. Sampler collects the water sample from the selected sample location as described in the Health and Safety Policy, "Health and Safety Requirements In Lieu of a Site Specific Health and Safety Plan When Sampling Residential Water Wells (Agency P-001-OLQ-X-XX-06-P-R1)".
14. Sampler replaces container cap as described in the Health and Safety Policy, "Health and Safety Requirements In Lieu of a Site Specific Health and Safety Plan When Sampling Residential Water Wells (Agency P-001-OLQ-X-XX-06-P-R1)".
15. Sampler completes filling out the Sample Field Sheets as described in the Chemistry Support Field Documentation SOP.
16. Sampler immediately places the collected water sample containers in ziplock-type plastic storage bags, seals bags, and places the bagged sample containers in the sample cooler.
17. Sampler removes Personal Protection Equipment (PPE) as described in the Health and Safety Policy, "Health and Safety Requirements In Lieu of a Site Specific Health and Safety Plan When Sampling Residential Water Wells (Agency P-001-OLQ-X-XX-06-P-R1)"
18. Is the sampling event complete? If yes, continue to step 19; if no, repeat steps 5-17 until sampling event is complete.
19. Sampler fills out Chain of Custody as described in the Chemistry Support Field Documentation SOP.
20. Sampler delivers sample cooler and Chain of Custody to the laboratory or shipping courier (i.e. FedEx, UPS) drop point.
21. Sampler completes and delivers field documentation from the sampling event to the SSC as described in the Chemistry Support Field Documentation SOP.

6. Standards and checklists

Chemistry Support Field Documentation SOP contains documentation that is utilized to assure specific steps are completed.
Chemistry Support Sample Request Sheet Sign-Off SOP M-002-OLQ-X-XX-06-S-R0 provides reference for the sampler to assure appropriate analytical parameters, media, numbers of samples are being collected.
Guidance for the Disposal of Investigative Derived Waste.

The following documents describe sampling methods and contain information that describes how samples are to be collected, maintained, preserved, and holding time requirements:

- IDEM OLQ Request for Proposal (RFP) 5-102
- USEPA Methods Guidance for the Analysis of Water

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- Analytical Methods for Drinking Water
- Methods for the Determination of Organic Compounds in Drinking Water, Supplemental III
- Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Supplemental I
- USEPA CLP National Functional Guidelines
- Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd edition
- Health and Safety Requirements In Lieu of a Site Specific Health and Safety Plan When Sampling Residential Water Wells (Agency P-001-OLQ-X-XX-06-P-R1)

7. Records Management

Upon completion of the verification, validation and the assessment of the data package, the verification and validation memorandum, tables, and all field documentation are attached to the data package and routed back to the PM. The original checklist(s), a copy of the field documentation, and a copy of the verification and validation memorandum are kept in the Chemistry Section. The PM forwards the completed documentation to the IDEM Central Files.

8. Quality Assurance / Quality Control

Quality Assurance/Quality Control is monitored by the submittal of the completed field documentation and via the data verification and validation process.

9. Continuous Improvement Cycle

Triggers / Performance measures & standards

The data verification and validation process reviews the sampling documentation for any performance problems. Triggers may include:

- Broken container
- Contaminated equipment blank samples
- Improper holding temperatures
- Inadequate QA/QC samples
- Inadequate number of samples
- Inappropriate analytical method for sampling data quality objective
- Incorrect sample containers
- Cross-contaminated samples
- Misunderstanding between IDEM and the analytical laboratory
- Validation and/or verification of data indicates qualified or unusable data
- Incomplete field documentation
- Field documentation not submitted to SSC.

Trigger Response

If the same problem is documented on a routine basis, then an investigation of the cause of the problem will be initiated. Evaluation of identified changes will determine whether any action is warranted.

Modification procedures

The staff within Chemistry Support or the QAO can identify a potential change. The Section QA Contact will be notified and take appropriate action. Results of the investigation will be used to determine whether sampling practices need to be updated or sampler need additional training.

Assessment

Changes will be assessed by monitoring the quality of the work product delivered to the peer reviewers and ECS. The Section QA Contact will evaluate the SOP biannually to determine if aspects of the SOP are still accurate, appropriate and applicable.

10. References

IDEM OLQ Request for Proposal (RFP) 5-102
Chemistry Support Field Documentation, P-004-OLQ-S-CH-07-S-R0
Chemistry Support Sample Request Sheet Sign-Off, M-002-OLQ-X-XX-06-S-R0
USEPA Office of Ground Water and Drinking Water
USEPA Methods Guidance for the Analysis of Water
Analytical Methods for Drinking Water
Methods for the Determination of Organic Compounds in Drinking Water, Supplemental III
Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Supplemental I
USEPA CLP National Functional Guidelines
Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd edition
Health and Safety Requirements In Lieu of a Site Specific Health and Safety Plan When Sampling Residential Water Wells (Agency P-001-OLQ-X-XX-06-P-R1)

11. History of Revisions

Revisions: 0

12. Appendices

N/A